Trend Study 19A-1-02

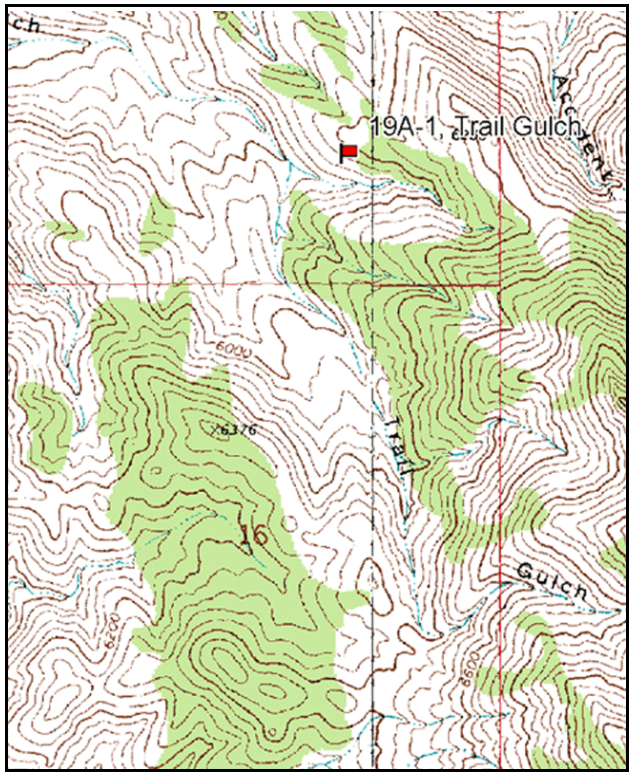
Study site name: Trail Gulch . Vegetation type: Stansbury Cliffrose .

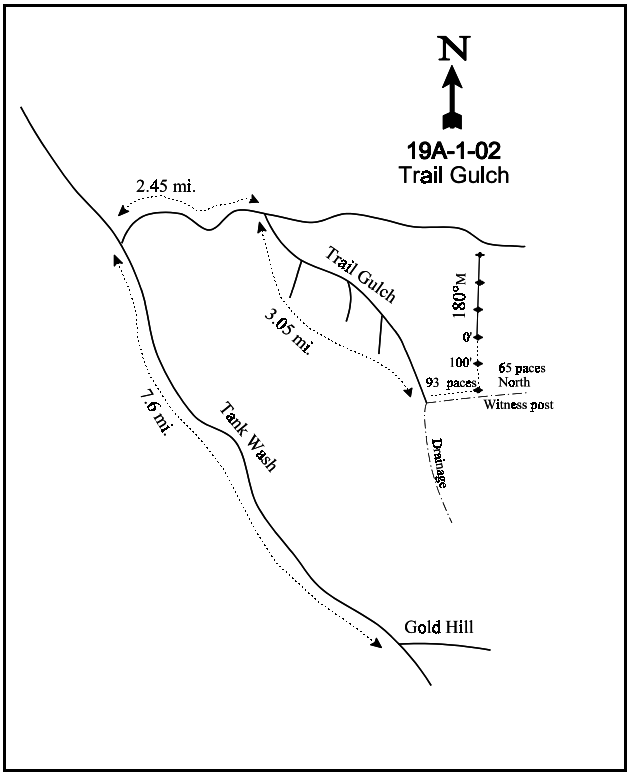
Compass bearing: frequency baseline 180 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). Rebar: none on site, too rocky.

LOCATION DESCRIPTION

Beginning at Gold Hill, proceed northwesterly toward Gold Hill Pass and Tank Wash for 7.60 miles to a road to the north. Turn right and proceed northerly for 2.45 miles to a dirt road to the southeast up Trail Gulch. Proceed up Trail Gulch for 3.05 miles staying to the left (straight) at all intersections. Stop where the road ends and two drainages come together. From the intersection of the streambeds, walk 93 paces easterly, along the left drainage to a green steel "T" fencepost on the north side of the streambed. From the fencepost, walk 65 paces north to the 0-foot baseline stake. The study is marked by green steel "T" fenceposts approximately 12 to 18 inches in height. The 0-foot baseline stake has a red browse tag, number 3970, attached.




Map Name: Ochre Mountain

Diagrammatic Sketch

Township 7S , Range 18W , Section 9

GPS: NAD 27, UTM 12S 4456887 N 255287 E

## DISCUSSION

### Trail Gulch - Trend Study No. 19A-1

The Trail Gulch study monitors winter range on the north end of the Deep Creek Mountains. The site is dry, rocky, and occupied by a sparse stand of Stansbury cliffrose in association with scattered Utah juniper. Elevation is approximately 5,800 feet with a south aspect. Slope varies on the site from 30% to 40%. In 1983, forage utilization was reportedly intense, although relatively few deer pellet groups were observed. In 1989 and 1997, utilization by livestock and wildlife was noted as infrequent. A pellet group transect read on site in 2002 estimated 22 deer days use/acre (55 ddu/ha), but there was no evidence of livestock use on the site. Several broods of chukars were observed in the area in 1983.

The soil is very rocky and highly eroded. Rocks are angular shaped and uniformly dark grey in color. Textural and chemical analysis indicates a clay soil with a neutral reaction (pH 7.1). The effective rooting depth was estimated at 15 inches, with a soil temperature averaging 61°F at 17 inches in depth. Phosphorous levels were measured at 7.7 ppm in the soil. Phosphorous levels less than 10 ppm may limit normal plant growth and development. Bare ground has been low to moderately low in all years, while vegetation and litter are moderately abundant on the site. Rock and pavement cover are very high being estimated from 44%-51% in all readings. The erosion condition class was assessed as slight in 2002, with soil build-up noted around the baseline posts.

The key browse species are Stansbury cliffrose, Nevada ephedra, and black sagebrush. Stansbury cliffrose density was estimated at 340 plants/acre in 1997 and 380 plants/acre in 2002. The Stansbury cliffrose age structure is indicative of a stable population with mostly mature plants and few young in 2002. Utilization of cliffrose was moderate to heavy in 2002, but lighter in the previous readings. Decadence was moderately low in 1997 and 2002 at less than 20%, a decline from 40% in 1989. Vigor has been generally good in all readings, with 11% of the population displaying poor vigor in 2002. Even with drought in 2002, cliffrose had an abundance of flowers and annual leaders, although the growth of annual leaders was low at less than two inches. Nevada ephedra had an estimated density of 660 plants/acre in 2002, a decline from 820 plants/acre in 1997. The decline in density is due to the loss of most of the young age class in 2002. Decadence has been moderately high in all years, except in 1997, when only 7% of the population was classified as decadent. Vigor was normal in 1989 and 1997, but poor in 1983 and 2002. Use was heavy in 1983, light to moderate in 1989 and 1997, and moderate to heavy in 2002. The population of black sagebrush was estimated at 1,400 plants/acre in 2002. Use on black sagebrush has been moderate overall and vigor has been generally good. Decadence has ranged from 11% in 1983 to 53% in 1989. Annual leaders averaged less than one inch of growth on black sagebrush in 2002. Many plants were experiencing leaf drop due to the very dry conditions.

Other browse sampled on the site include shadscale, California brickellia, broom snakeweed, low rabbitbrush, and littleleaf horsebrush. Broom snakeweed was the most abundant shrub on the site in 1983 and 1989, but declined considerably in 1997 and 2002. Single-leaf pinyon and Utah juniper are scattered throughout the site as well. Point-center quarter data estimated14 pinyon/acre and 53 juniper/acre in 1997.

The dominant grass on the site is cheatgrass. It provided 64% of the grass cover in 1997 and 52% in 2002. Cheatgrass nested frequency significantly decreased in 2002 with drought as most plants were very small. It is not uniformly distributed throughout the site, rather it occurs in dense patches. Bluebunch wheatgrass is the most abundant perennial grass. It maintained a stable frequency in 1997 and 2002. Bluebunch wheatgrass had good stature and vigor for the most part in 2002, although a few plants were starting to yellow because of the dry conditions. Other less abundant grasses that have been sampled on the site include galleta, Indian ricegrass, Sandberg bluegrass, bottlebrush squirreltail, and sand dropseed. The forb component, including annual species, is basically non-existent. Longleaf phlox is the most abundant species but was sampled in only a handful of quadrats in all years.

1983 APPARENT TREND ASSESSMENT

This is a very dry site with minimal ground cover. Soil erosion is ongoing and of considerable magnitude. High intensity storms are capable of moving large amounts of soil downslope. Soil trend appears to be declining. Vegetation condition is fair to poor, but trend appears essentially stable. Productivity on the site is limited by low precipitation and shallow soils. Although browse utilization is intense, there is not an obvious negative effect on any species, except Nevada ephedra, which may be declining.

1989 TREND ASSESSMENT

Trend for soil is stable. Soil erosion is ongoing and unavoidable, though not severe due to the limited precipitation. Bare ground slightly declined in 1989. The browse trend is stable. The key species, black sagebrush, Stansbury cliffrose, and Nevada ephedra, show slight increases in density. However, they also have increased in percent decadence due to drought conditions. Trend for the herbaceous understory is stable. The sum of nested frequency for perennials has slightly increased since 1983, although herbaceous plants remain limited.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - stable (3)

1997 TREND ASSESSMENT

Erosion is present but not accelerated. Percent bare ground again declined from 1989 levels. Rock and pavement cover remain very high. Although this may protect the soil in some areas, rock and pavement can also accelerate runoff in other areas. Soil trend is stable. Stansbury cliffrose density appears stable with slight increases in black sagebrush and Nevada ephedra densities. Utilization is lower than reported in past years which coincides with the lack of pellet groups encountered. The broom snakeweed density has greatly declined, likely due to the drought conditions. Browse trend is stable for the key browse species. The perennial herbaceous understory has changed very little since 1989. Bluebunch wheatgrass sum of nested frequency has significantly increased while galleta grass sum of nested frequency has significantly decreased. Cheatgrass is the dominant grass at this time and will always be a part of this community. Herbaceous understory trend is stable.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - stable (3)

2002 TREND ASSESSMENT

Trend for soil is slightly down. Vegetation and litter cover declined, while bare ground increased. These changes in soil surface conditions are drought induced and should reverse as precipitation patterns return to normal. Slight erosion is occurring as determined by the erosion condition classification. Trend for browse is stable, but the key species are showing obvious negative signs of drought, specifically minimal annual leader growth and increased decadence. Black sagebrush has increased in density since 1997, but also shows increased use and decadency. Cliffrose shows stability in density and percent decadence, but did display increased utilization. Nevada ephedra, while not the most important browse, does have additive value. The ephedra population shows increases in utilization, poor vigor, and decadence. The herbaceous understory has a stable trend. Herbaceous species remain limited, especially forbs. Bluebunch wheatgrass is the only moderately abundant perennial, but has slightly declined in nested frequency. However, the decline was not statistically significant. Cheatgrass significantly declined in nested frequency in 2002 with continued drought.

TREND ASSESSMENT
soil - slightly down (2)
browse - stable (3) but showing negative effects of drought
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 19A, Study no: 1

| Type | Species | Nested Frequency | | | | Quadrat Frequency | | | | Average Cover % | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | '83 | '89 | '97 | '02 | '83 | '89 | '97 | '02 | '97 | '02 |
| G | Agropyron spicatum | a43 | a47 | b97 | b82 | 20 | 24 | 36 | 39 | 3.09 | 4.33 |
| G | Bromus tectorum (a) | - | - | b248 | a196 | - | - | 80 | 65 | 7.17 | 5.39 |
| G | Hilaria jamesii | c37 | bc33 | ab13 | a5 | 17 | 13 | 6 | 4 | .36 | .09 |
| G | Oryzopsis hymenoides | 5 | 6 | 6 | 1 | 3 | 3 | 3 | 1 | .21 | .15 |
| G | Poa secunda | 3 | 14 | 15 | 19 | 3 | 7 | 7 | 10 | .40 | .29 |
| G | Sitanion hystrix | - | - | 6 | 7 | - | - | 2 | 4 | .03 | .07 |
| G | Sporobolus cryptandrus | a- | b20 | a- | a4 | - | 8 | - | 1 | - | .00 |
| Total for Annual Grasses | | 0 | 0 | 248 | 196 | 0 | 0 | 80 | 65 | 7.17 | 5.39 |
| Total for Perennial Grasses | | 88 | 120 | 137 | 118 | 43 | 55 | 54 | 59 | 4.11 | 4.95 |
| Total for Grasses | | 88 | 120 | 385 | 314 | 43 | 55 | 134 | 124 | 11.29 | 10.35 |
| F | Astragalus utahensis | - | - | 3 | - | - | - | 1 | - | .00 | - |
| F | Cirsium neomexicanum | a6 | b19 | a1 | a1 | 3 | 11 | 1 | 1 | .00 | .00 |
| F | Descurainia pinnata (a) | - | - | - | 4 | - | - | - | 2 | - | .01 |
| F | Draba spp. (a) | - | - | - | 1 | - | - | - | 1 | - | .00 |
| F | Erodium cicutarium (a) | - | - | - | 3 | - | - | - | 1 | - | .00 |
| F | Lappula occidentalis (a) | - | - | - | 1 | - | - | - | 1 | - | .00 |
| F | Lomatium spp. | - | - | 1 | 3 | - | - | 1 | 1 | .00 | .00 |
| F | Lygodesmia grandiflora | 3 | - | - | - | 1 | - | - | - | - | - |
| F | Machaeranthera spp | 1 | - | - | - | 1 | - | - | - | - | - |
| F | Phlox longifolia | - | 3 | 10 | 6 | - | 2 | 4 | 3 | .04 | .01 |
| F | Sphaeralcea coccinea | 2 | 10 | - | 3 | 2 | 4 | - | 1 | - | .00 |

| Type | Species | Nested Frequency | | | | Quadrat Frequency | | | | Average Cover % | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | '83 | '89 | '97 | '02 | '83 | '89 | '97 | '02 | '97 | '02 |
| F | Streptanthus cordatus | - | - | - | 2 | - | - | - | 1 | - | .00 |
| F | Unknown forb-perennial | - | - | 8 | - | - | - | 3 | - | .06 | - |
| F | Zigadenus paniculatus | - | - | - | 4 | - | - | - | 2 | - | .01 |
| Total for Annual Forbs | | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 5 | 0 | 0.02 |
| Total for Perennial Forbs | | 12 | 32 | 23 | 19 | 7 | 17 | 10 | 9 | 0.12 | 0.04 |
| Total for Forbs | | 12 | 32 | 23 | 28 | 7 | 17 | 10 | 14 | 0.12 | 0.06 |

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 19A, Study no: 1

| Type | Species | Strip Frequency | | Average Cover % | |
|---|---|---|---|---|---|
| | | '97 | '02 | '97 | '02 |
| B | Artemisia nova | 21 | 25 | 5.40 | 3.59 |
| B | Atriplex confertifolia | 5 | 3 | .53 | .03 |
| B | Brickellia californica | 5 | 2 | .03 | - |
| B | Chrysothamnus viscidiflorus stenophyllus | 10 | 5 | .15 | .38 |
| B | Cowania mexicana stansburiana | 15 | 15 | 2.54 | 4.02 |
| B | Echinocereus spp. | 0 | 1 | - | - |
| B | Ephedra nevadensis | 12 | 17 | 1.78 | .97 |
| B | Gutierrezia sarothrae | 19 | 7 | .60 | .00 |
| B | Juniperus osteosperma | 8 | 5 | 11.46 | 10.00 |
| B | Opuntia spp. | 2 | 3 | - | .00 |
| B | Pinus monophylla | 1 | 3 | - | .15 |
| B | Tetradymia glabrata | 12 | 4 | 1.09 | - |
| Total for Browse | | 110 | 90 | 23.60 | 19.16 |

CANOPY COVER -- LINE INTERCEPT
Herd unit 19A, Study no: 1

| Species | Percent Cover | |
|---|---|---|
| | '97 | '02 |
| Artemisia nova | - | 4.17 |
| Brickellia californica | - | .08 |
| Chrysothamnus viscidiflorus stenophyllus | - | .67 |
| Cowania mexicana stansburiana | - | 7.42 |
| Ephedra viridis | - | 2.25 |
| Juniperus osteosperma | 15 | 13.08 |
| Pinus monophylla | - | 2.08 |
| Tetradymia glabrata | - | .08 |

Key Browse Annual Leader Growth
Herd unit 19A , Study no: 1

| Species | Average leader growth (in) |
|---|---|
| | '02 |
| Artemisia nova | 0.9 |
| Cowania mexicana stansburiana | 1.8 |

Point-Quarter Tree Data
Herd unit 19A , Study no: 1

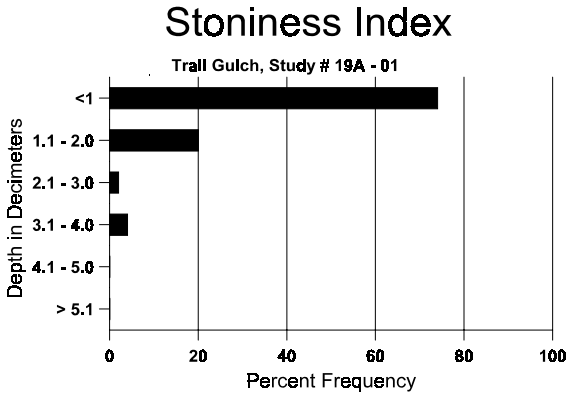
| Species | Trees per Acre | Average diameter (in) |
|---|---|---|
| | '97 | '97 |
| Juniperus osteosperma | 53 | 8.7 |
| Pinus monophylla | 14 | 4.1 |

BASIC COVER --
Herd unit 19A, Study no: 1

| Cover Type | Nested Frequency | | Average Cover % | | | |
|---|---|---|---|---|---|---|
| | '97 | '02 | '83 | '89 | '97 | '02 |
| Vegetation | 295 | 248 | .25 | 4.00 | 35.30 | 28.60 |
| Rock | 324 | 319 | 27.00 | 30.00 | 27.53 | 32.42 |
| Pavement | 285 | 312 | 20.25 | 21.50 | 16.47 | 18.55 |
| Litter | 361 | 335 | 39.50 | 33.50 | 30.37 | 27.46 |
| Cryptogams | 111 | 89 | .25 | 1.50 | 1.66 | 2.11 |
| Bare Ground | 140 | 237 | 12.75 | 9.50 | 3.34 | 13.38 |

SOIL ANALYSIS DATA --
Herd Unit 19A, Study no: 1, Trail Gulch

| Effective rooting depth (in) | Temp °F (depth) | pH | %sand | %silt | %clay | %0M | PPM P | PPM K | dS/m |
|---|---|---|---|---|---|---|---|---|---|
| 8.9 | 64.4 (12.6) | 7.1 | 38.0 | 32.4 | 29.6 | 2.4 | 7.7 | 76.8 | 0.7 |




PELLET GROUP FREQUENCY --
Herd unit 19A, Study no: 1

| Type | Quadrat Frequency | |
|---|---|---|
| | '97 | '02 |
| Rabbit | 8 | 9 |
| Deer | - | 2 |

| Pellet Transect | |
|---|---|
| Pellet Groups per Acre | Days Use per Acre (ha) |
| 02 | 02 |
| - | - |
| 287 | 22 (55) |

BROWSE CHARACTERISTICS --
Herd unit 19A, Study no: 1

| AGE | YR | Form Class (No. of Plants) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Vigor Class 1 | 2 | 3 | 4 | Plants Per Acre | Average (inches) Ht. | Cr. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Artemisia nova | | | | | | | | | | | | | | | | | | |
| S | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 33 | | | 1 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| Y | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| | 02 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| M | 83 | - | 6 | 2 | - | - | - | - | - | - | 8 | - | - | - | 266 | 13 | 25 | 8 |
| | 89 | 3 | 2 | - | 2 | - | - | - | - | - | 7 | - | - | - | 233 | 12 | 29 | 7 |
| | 97 | 25 | 8 | - | - | - | - | - | - | - | 33 | - | - | - | 660 | 13 | 29 | 33 |
| | 02 | 17 | 26 | 6 | - | - | - | - | - | - | 49 | - | - | - | 980 | 10 | 21 | 49 |
| D | 83 | - | - | 1 | - | - | - | - | - | - | - | - | 1 | - | 33 | | | 1 |
| | 89 | - | 6 | - | 2 | - | - | - | - | - | 8 | - | - | - | 266 | | | 8 |
| | 97 | 8 | - | - | - | - | - | - | - | - | 5 | - | - | 3 | 160 | | | 8 |
| | 02 | 7 | 10 | 3 | - | - | - | - | - | - | 16 | - | - | 4 | 400 | | | 20 |
| X | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 140 | | | 7 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 140 | | | 7 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 67% | 33% | 11% | |
| '89 | 53% | 00% | 00% | +40% |
| '97 | 19% | 00% | 07% | +41% |
| '02 | 51% | 13% | 06% | +40% |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '83 | 299 | Dec: | 11% | |
| '89 | 499 | | 53% | |
| '97 | 840 | | 19% | |
| '02 | 1400 | | 29% | |

| Artemisia tridentata vaseyana | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y | 83 | 1 | - | - | - | - | - | - | - | - | - | - | 1 | - | 33 | | | 1 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 00% | 00% | 100% | |
| '89 | 00% | 00% | 00% | |
| '97 | 00% | 00% | 00% | |
| '02 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | |
|---|---|---|---|
| '83 | 33 | Dec: | - |
| '89 | 0 | | - |
| '97 | 0 | | - |
| '02 | 0 | | - |

| AGE | YR | Form Class (No. of Plants) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Vigor Class 1 | 2 | 3 | 4 | Plants Per Acre | Average (inches) Ht. | Cr. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Atriplex confertifolia | | | | | | | | | | | | | | | | | | |
| S | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| M | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 97 | 4 | - | - | - | - | - | - | - | - | 4 | - | - | - | 80 | 8 | 11 | 4 |
| | 02 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | 6 | 12 | 1 |
| D | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | 2 | - | - | - | - | - | - | - | - | 2 | - | - | - | 40 | | | 2 |
| | 02 | 2 | - | - | - | - | - | - | - | - | 1 | - | - | 1 | 40 | | | 2 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 00% | 00% | 00% | |
| '89 | 00% | 00% | 00% | |
| '97 | 00% | 00% | 00% | -50% |
| '02 | 00% | 00% | 33% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| | '83 | 0 | Dec: | 0% |
| | '89 | 0 | | 0% |
| | '97 | 120 | | 33% |
| | '02 | 60 | | 67% |

| Brickellia californica | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | 3 | - | - | - | - | - | - | - | - | 3 | - | - | - | 60 | | | 3 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| Y | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| M | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 97 | 7 | - | - | - | - | - | - | - | - | 7 | - | - | - | 140 | 12 | 14 | 7 |
| | 02 | 2 | - | - | - | - | - | - | - | - | 2 | - | - | - | 40 | 10 | 15 | 2 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 00% | 00% | 00% | |
| '89 | 00% | 00% | 00% | |
| '97 | 00% | 00% | 00% | -75% |
| '02 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| | '83 | 0 | Dec: | - |
| | '89 | 0 | | - |
| | '97 | 160 | | - |
| | '02 | 40 | | - |

| AGE | YR | Form Class (No. of Plants) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Vigor Class 1 | 2 | 3 | 4 | Plants Per Acre | Average (inches) Ht. | Cr. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chrysothamnus viscidiflorus stenophyllus | | | | | | | | | | | | | | | | | | |
| M | 83 | 4 | - | - | - | - | - | - | - | - | 3 | 1 | - | - | 133 | 8 | 10 | 4 |
| | 89 | 2 | - | - | - | - | - | - | - | - | 2 | - | - | - | 66 | 4 | 6 | 2 |
| | 97 | 9 | - | - | - | - | - | - | - | - | 9 | - | - | - | 180 | 10 | 16 | 9 |
| | 02 | 4 | - | - | - | - | - | - | - | - | 4 | - | - | - | 80 | 11 | 24 | 4 |
| D | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | 3 | - | - | - | - | - | - | - | - | 3 | - | - | - | 100 | | | 3 |
| | 97 | 1 | - | - | 1 | - | - | - | - | - | 1 | - | - | 1 | 40 | | | 2 |
| | 02 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 00% | 00% | 00% | +20% |
| '89 | 00% | 00% | 00% | +25% |
| '97 | 00% | 00% | 09% | -55% |
| '02 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '83 | 133 | Dec: | 0% |
| '89 | 166 | | 60% |
| '97 | 220 | | 18% |
| '02 | 100 | | 20% |

| Cowania mexicana stansburiana | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| Y | 83 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 33 | | | 1 |
| | 89 | 5 | - | - | - | - | - | - | - | - | 5 | - | - | - | 166 | | | 5 |
| | 97 | 1 | 2 | - | - | - | - | - | - | - | 3 | - | - | - | 60 | | | 3 |
| | 02 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| M | 83 | 2 | 2 | 1 | - | - | - | - | - | - | 5 | - | - | - | 166 | 44 | 67 | 5 |
| | 89 | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | 33 | 55 | 71 | 1 |
| | 97 | 11 | - | - | - | - | - | - | - | - | 11 | - | - | - | 220 | 38 | 60 | 11 |
| | 02 | 2 | 4 | 3 | - | 3 | 3 | - | - | - | 15 | - | - | - | 300 | 44 | 63 | 15 |
| D | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | 2 | 1 | - | 1 | - | - | - | - | - | 4 | - | - | - | 133 | | | 4 |
| | 97 | 3 | - | - | - | - | - | - | - | - | 2 | - | - | 1 | 60 | | | 3 |
| | 02 | 1 | 1 | - | - | - | 1 | - | - | - | 1 | - | - | 2 | 60 | | | 3 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 33% | 17% | 00% | +40% |
| '89 | 10% | 00% | 00% | + 2% |
| '97 | 12% | 00% | 06% | +11% |
| '02 | 42% | 37% | 11% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | |
|---|---|---|---|
| '83 | 199 | Dec: | 0% |
| '89 | 332 | | 40% |
| '97 | 340 | | 18% |
| '02 | 380 | | 16% |

| AGE | YR | Form Class (No. of Plants) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Vigor Class 1 | 2 | 3 | 4 | Plants Per Acre | Average (inches) Ht. | Cr. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Echinocactus spp. | | | | | | | | | | | | | | | | | | |
| Y | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 33 | | | 1 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| M | 83 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 33 | 3 | 5 | 1 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 02 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | 4 | 5 | 1 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 00% | 00% | 00% | + 0% |
| '89 | 00% | 00% | 00% | |
| '97 | 00% | 00% | 00% | |
| '02 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '83 | 33 | Dec: | | - |
| '89 | 33 | | | - |
| '97 | 0 | | | - |
| '02 | 20 | | | - |

| Ephedra nevadensis | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | 5 | - | - | - | - | - | - | - | - | 5 | - | - | - | 166 | | | 5 |
| | 97 | 8 | - | - | - | - | - | - | - | - | 8 | - | - | - | 160 | | | 8 |
| | 02 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| M | 83 | - | - | 6 | - | - | - | - | - | - | - | - | 6 | - | 200 | 18 | 33 | 6 |
| | 89 | - | 2 | - | - | 2 | - | - | - | - | 4 | - | - | - | 133 | 15 | 24 | 4 |
| | 97 | 16 | 13 | - | 1 | - | - | - | - | - | 30 | - | - | - | 600 | 20 | 29 | 30 |
| | 02 | 6 | 4 | 2 | - | - | 6 | - | - | - | 12 | - | 6 | - | 360 | 18 | 32 | 18 |
| D | 83 | - | - | 3 | - | - | - | - | - | - | - | - | 3 | - | 100 | | | 3 |
| | 89 | 1 | 4 | - | 1 | 1 | - | - | - | - | 7 | - | - | - | 233 | | | 7 |
| | 97 | 2 | 1 | - | - | - | - | - | - | - | 3 | - | - | - | 60 | | | 3 |
| | 02 | 4 | 5 | 3 | - | - | 2 | - | - | - | 5 | - | - | 9 | 280 | | | 14 |
| X | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 20 | | | 1 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | | | 4 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 00% | 100% | 100% | +44% |
| '89 | 56% | 00% | 00% | +35% |
| '97 | 34% | 00% | 00% | -20% |
| '02 | 27% | 39% | 45% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | |
|---|---|---|---|
| '83 | 300 | Dec: | 33% |
| '89 | 532 | | 44% |
| '97 | 820 | | 7% |
| '02 | 660 | | 42% |

| AGE | YR | Form Class (No. of Plants) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Vigor Class 1 | 2 | 3 | 4 | Plants Per Acre | Average (inches) Ht. | Cr. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gutierrezia sarothrae | | | | | | | | | | | | | | | | | | |
| S | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | 5 | - | - | - | - | - | - | - | - | 5 | - | - | - | 166 | | | 5 |
| | 97 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| Y | 83 | 6 | - | - | - | - | - | - | - | - | 6 | - | - | - | 200 | | | 6 |
| | 89 | 9 | - | - | - | - | - | - | - | - | 9 | - | - | - | 300 | | | 9 |
| | 97 | 2 | - | - | - | - | - | - | - | - | 2 | - | - | - | 40 | | | 2 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| M | 83 | 70 | - | - | - | - | - | - | - | - | 70 | - | - | - | 2333 | 8 | 8 | 70 |
| | 89 | 45 | - | - | 2 | - | - | - | - | - | 47 | - | - | - | 1566 | 5 | 7 | 47 |
| | 97 | 30 | - | - | - | - | - | - | - | - | 30 | - | - | - | 600 | 7 | 12 | 30 |
| | 02 | 2 | - | - | - | - | - | - | - | - | 2 | - | - | - | 40 | 8 | 12 | 2 |
| D | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | 25 | - | - | - | - | - | - | - | - | 25 | - | - | - | 833 | | | 25 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 02 | 7 | - | - | - | - | - | - | - | - | 1 | - | - | 6 | 140 | | | 7 |
| X | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 20 | | | 1 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | | | 5 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 00% | 00% | 00% | + 6% |
| '89 | 00% | 00% | 00% | -76% |
| '97 | 00% | 00% | 00% | -72% |
| '02 | 00% | 00% | 67% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| | '83 | 2533 | Dec: | 0% |
| | '89 | 2699 | | 31% |
| | '97 | 640 | | 0% |
| | '02 | 180 | | 78% |

| AGE | YR | Form Class (No. of Plants) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Vigor Class 1 | 2 | 3 | 4 | Plants Per Acre | Average (inches) Ht. | Cr. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Juniperus osteosperma | | | | | | | | | | | | | | | | | | |
| Y | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | 2 | - | - | - | - | - | - | - | - | 2 | - | - | - | 66 | | | 2 |
| | 97 | 2 | - | - | - | - | - | - | - | - | 2 | - | - | - | 40 | | | 2 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| M | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 89 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 33 | 118 | 197 | 1 |
| | 97 | 3 | - | - | 2 | - | - | - | - | - | 5 | - | - | - | 100 | - | - | 5 |
| | 02 | 2 | - | - | - | - | - | - | 3 | - | 5 | - | - | - | 100 | - | - | 5 |
| D | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| X | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 20 | | | 1 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 00% | 00% | 00% | |
| '89 | 00% | 00% | 00% | +38% |
| '97 | 00% | 00% | 00% | -38% |
| '02 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '83 | 0 | Dec: | | 0% |
| '89 | 99 | | | 0% |
| '97 | 160 | | | 13% |
| '02 | 100 | | | 0% |

| Opuntia spp. | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 33 | | | 1 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| M | 83 | 1 | - | - | - | - | - | - | - | - | - | - | 1 | - | 33 | 4 | 18 | 1 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 97 | 2 | - | - | - | - | - | - | - | - | 2 | - | - | - | 40 | 7 | 13 | 2 |
| | 02 | 2 | - | - | 2 | - | - | - | - | - | 4 | - | - | - | 80 | 4 | 12 | 4 |
| D | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | 1 | - | - | - | - | - | - | - | - | - | - | 1 | - | 33 | | | 1 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 00% | 00% | 100% | +50% |
| '89 | 00% | 00% | 50% | -39% |
| '97 | 00% | 00% | 00% | +50% |
| '02 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | |
|---|---|---|---|
| '83 | 33 | Dec: | 0% |
| '89 | 66 | | 50% |
| '97 | 40 | | 0% |
| '02 | 80 | | 0% |

| AGE | YR | Form Class (No. of Plants) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Vigor Class 1 | 2 | 3 | 4 | Plants Per Acre | Average (inches) Ht. | Cr. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pinus monophylla | | | | | | | | | | | | | | | | | | |
| S | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 02 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| Y | 83 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 33 | | | 1 |
| | 89 | 1 | - | - | 1 | - | - | - | - | - | 2 | - | - | - | 66 | | | 2 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 02 | 2 | - | - | - | - | - | - | - | - | 2 | - | - | - | 40 | | | 2 |
| M | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 97 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | - | - | 1 |
| | 02 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | - | - | 1 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 00% | 00% | 00% | +50% |
| '89 | 00% | 00% | 00% | -70% |
| '97 | 00% | 00% | 00% | +67% |
| '02 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| | '83 | 33 | Dec: | - |
| | '89 | 66 | | - |
| | '97 | 20 | | - |
| | '02 | 60 | | - |

| Tetradymia glabrata | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | 2 | - | - | - | - | - | - | - | - | 2 | - | - | - | 66 | | | 2 |
| | 97 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| M | 83 | 2 | - | - | - | - | - | - | - | - | 2 | - | - | - | 66 | 26 | 38 | 2 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 97 | 8 | - | - | 1 | - | - | - | - | - | 9 | - | - | - | 180 | 23 | 21 | 9 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | 22 | 14 | 0 |
| D | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | 3 | - | - | 1 | - | - | - | - | - | 2 | - | 2 | - | 133 | | | 4 |
| | 97 | 7 | - | - | - | - | - | - | - | - | 5 | - | - | 2 | 140 | | | 7 |
| | 02 | 6 | - | - | - | - | - | - | - | - | - | - | 1 | 5 | 120 | | | 6 |
| X | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | | | 4 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 220 | | | 11 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 00% | 00% | 00% | +67% |
| '89 | 00% | 00% | 33% | +41% |
| '97 | 00% | 00% | 12% | -65% |
| '02 | 00% | 00% | 100% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| | '83 | 66 | Dec: | 0% |
| | '89 | 199 | | 67% |
| | '97 | 340 | | 41% |
| | '02 | 120 | | 100% |